

A. D. Hershey and Arthur Kornberg have made outstanding contributions in the application of radioisotopes for fundamental discoveries in the chemistry of heredity and virus infection.

Hershey was able to tag the protein of a virus particle with radioactive sulfur, the nucleic acid (DNA) with radioactive phosphorus. These labels made it possible, for the first time, to trace by chemical methods the fate of an infecting virus particle after it had entered the host cell. He showed that only the DNA entered the cell, the protein coat of the virus being left outside. In combination with equally brilliant genetic studies, it could now be understood that the entering DNA is the genetic material of the virus. This in turn suffices to reproduce the whole virus particle, and to interfere with the normal function of the infected cell.\*

Kornberg used DNA constituents labelled with radioactive carbon to attack one of the most formidable problems of biology, the biochemistry of replication of nucleic acids. At a time when gene reproduction had not yet been generally assimilated as a straightforward problem in chemistry, he boldly searched for an enzyme that would synthesize DNA. Starting from the faintest leads, the incorporating of a few atoms of radioactive carbon into a DNA-like polymer, he has uncovered a new world of biochemistry at its junction with genetics, the system of enzymic transformations by which DNA is synthesized on the template of preformed DNA used to prime the reaction mixture.\*\*

These studies have thrown tremendous new light on the most fundamental questions of biology, have erased the boundaries between chemistry, virology and genetics, have shown the way for immense strides in medicine, and in the purity and idealism of their realization are exemplary of the best of contemporary science.

\* Reference attached list.

\*\* Reference Kornberg's book, Enzymatic Synthesis of DNA, Wiley, 1962, is a comprehensive review of his work.

A. D. Hershey -- some recent contributions

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